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Effect of dark chocolate on arterial function in healthy individuals

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Abstract

Background: Epidemiologic studies suggest that high flavonoid intake confers a benefit on cardiovascular outcome. Endothelial function, arterial stiffness, and wave reflections are important determinants of cardiovascular performance and are predictors of cardiovascular risk.

Methods: The effect of flavonoid-rich dark chocolate (100 g) on endothelial function, aortic stiffness, wave reflections, and oxidant status were studied for 3 h in 17 young healthy volunteers according to a randomized, single-blind, sham procedure-controlled, cross-over protocol. Flow-mediated dilation (FMD) of the brachial artery, aortic augmentation index (AIx), and carotid-femoral pulse wave velocity (PWV) were used as measures of endothelial function, wave reflections, and aortic stiffness, respectively. Plasma oxidant status was evaluated with measurement of plasma malondialdehyde (MDA) and total antioxidant capacity (TAC).

Results: Chocolate led to a significant increase in resting and hyperemic brachial artery diameter throughout the study (maximum increase by 0.15 mm and 0.18 mm, respectively, P < .001 for both). The FMD increased significantly at 60 min (absolute increase 1.43%, P < .05). The AIx was significantly decreased with chocolate throughout the study (maximum absolute decrease 7.8%, P < .001), indicating a decrease in wave reflections, whereas PWV did not change to a significant extent. Plasma MDA and TAC did not change after chocolate, indicating no alterations in plasma oxidant status.

Conclusions: Our study shows for the first time that consumption of dark chocolate acutely decreases wave reflections, that it does not affect aortic stiffness, and that it may exert a beneficial effect on endothelial function in healthy adults. Chocolate consumption may exert a protective effect on the cardiovascular system; further studies are warranted to assess any long-term effects.

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